

REMARKS

The application has been reviewed in light of the Office Action dated June 1, 2004. Claims 1-4 and 6-13 are pending, with claims 1 and 8 being in independent form. Claim 5 was previously canceled, without prejudice or disclaimer. By this Amendment, claims 1 and 8 have been amended to place the claims in better form for examination, without narrowing the scope of the claimed invention.

The specification was objected to as having informalities.

The specification has been reviewed and amended to correct the formal matters noted in the Office Action.

Withdrawal of the objection to the specification is respectfully requested.

Claims 1 and 8 were objected to as having informalities.

By this Amendment, Applicants have amended claims 1 and 8 to place the claims in better form for examination, with particular attention to the formal matters raised in the Office Action.

Withdrawal of the objection to the claims is respectfully requested.

Claims 1-4 and 6-13 were rejected under 35 U.S.C. §103(a) as purportedly obvious over U.S. Patent No. 5,276,670 to Nogami et al. in view of U.S. Patent No. 5,948,496 to Kinoshita et al.

Applicants have carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 1 and 8 are patentable over the cited art, for at least the following reasons.

This application relates to a phase-change type optical

information recording medium which has excellent recording and reproducing characteristics irrespective of the linear velocity.

Conventional phase-change type optical information recording media in many instances are adapted for a high degree of modulation. However, there is a tendency that the characteristics of the recording signal at low linear velocity and after repetitive recording degrades for such media. It is desirable for optical information recording media to have recording and reproducing characteristics that allow the media to be used at a wide range of speeds and does not degrade after repeated use.

Applicants found that phase-change type optical information recording media having certain constructions and structures, as described in the application, can have excellent characteristics even over a range of low to high linear velocities. In particular, the application at, for example, page 15, line 21 through page 16, line 22, describes a phase-change type optical information recording medium comprising a recording layer which includes as a main component  $\text{Ag}_\alpha\text{In}_\beta\text{Sb}_\gamma\text{Te}_\delta$ , where  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  represent atomic percents,  $0.1 \leq \alpha \leq 2.0$ ,  $3.0 \leq \beta \leq 8.0$ ,  $65.0 \leq \gamma \leq 75.0$ ,  $15.0 \leq \delta \leq 30.0$ , and  $97 \leq \alpha + \beta + \gamma + \delta \leq 100$ , which is suitable for a wide range of linear velocities and more specifically, when the minimum and maximum linear velocities of rotation of the medium are respectively  $V_1$  and  $V_2$ , then a value of a degree of modulation corresponding to the maximum linear velocity  $I(V_2)$  divided by a degree of modulation corresponding to the maximum linear velocity  $I(V_1)$  is between 1 and 1.2. The claimed invention (of independent claims 1 and 8) include these

features.

The cited art does not disclose or suggest the claimed invention described in independent claims 1 and 8.

Nogami, as understood by Applicants, is directed to a phase change optical disk which purportedly does not require higher irradiation power at its outer peripheral position than that at its inner peripheral position, i.e. does not provide reduced recording sensitivity (or erasing sensitivity) at a position with a higher linear velocity. Nogami discloses a phase change optical disk having a recording film of a compound of In-Sb-Te having a composition of 21:36:43 (by atomic percent).

According to the Office Action, Nogami discloses a phase-change type optical information recording medium, wherein assuming that a minimum recording linear velocity to be  $V_1$ , a maximum recording linear velocity to be  $V_2$ , and a degree of modulation at the time of reading out information to be  $I(V)$ , then a value of  $I(V_2)/I(V_1)$  is within a range from 1 to 1.2.

As the Office Action acknowledges, Nogami does not disclose or suggest, however, a phase-change type optical information recording medium which has a recording layer having as a main component  $Ag_\alpha In_\beta Sb_\gamma Te_\delta$ , where  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  represent atomic percents,  $0.1 \leq \alpha \leq 2.0$ ,  $3.0 \leq \beta \leq 8.0$ ,  $65.0 \leq \gamma \leq 75.0$ ,  $15.0 \leq \delta \leq 30.0$ , and  $97 \leq \alpha + \beta + \gamma + \delta \leq 100$ . Nogami simply does not suggest how the phase-change type optical information recording medium disclosed therein can be adapted with a recording layer having as a main component  $Ag_\alpha In_\beta Sb_\gamma Te_\delta$ , where  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  represent atomic percents,  $0.1 \leq \alpha \leq 2.0$ ,  $3.0 \leq \beta \leq 8.0$ ,  $65.0 \leq \gamma$

$\leq 75.0$ ,  $15.0 \leq \delta \leq 30.0$ , and  $97 \leq \alpha + \beta + \gamma + \delta \leq 100$ , to provide excellent characteristics over a range of low to high linear velocities.

Kinoshita, as understood by Applicants, is directed to an optical recording medium which purportedly is highly sensitive at a recording linear velocity of 10 m/s or less. Kinoshita discloses an optical recording medium comprising a recording layer made up of a first layer of AgInSbTe (5:10:55:30 at. %) and a second layer of AgInSbTe (5:5:62:28 at. %). The medium, according to Kinoshita, has improved repetitive recording performance at a relatively low recording linear velocity.

The Office apparently acknowledges that Kinoshita, like Nogami, does not disclose a phase-change type optical information recording medium comprising a recording layer having as a main component  $\text{Ag}_\alpha\text{In}_\beta\text{Sb}_\gamma\text{Te}_\delta$ , where  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  represent atomic percents,  $0.1 \leq \alpha \leq 2.0$ ,  $3.0 \leq \beta \leq 8.0$ ,  $65.0 \leq \gamma \leq 75.0$ ,  $15.0 \leq \delta \leq 30.0$ , and  $97 \leq \alpha + \beta + \gamma + \delta \leq 100$ .

The Office Action contends, however, that the medium of Kinoshita comprising a layer of AgInSbTe (5:5:62:28 at. %) is "close to" a phase-change type optical information recording medium which has a recording layer having as a main component  $\text{Ag}_\alpha\text{In}_\beta\text{Sb}_\gamma\text{Te}_\delta$ , where  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  represent atomic percents,  $0.1 \leq \alpha \leq 2.0$ ,  $3.0 \leq \beta \leq 8.0$ ,  $65.0 \leq \gamma \leq 75.0$ ,  $15.0 \leq \delta \leq 30.0$ , and  $97 \leq \alpha + \beta + \gamma + \delta \leq 100$ , as provided by the claimed invention.

However, "close to" is not the test of obviousness under 35 U.S.C. §103.

Applicants found that when AgInSbTe is used as a material

for the recording layer, the physical properties of the alloy in many instances are substantially determined based on the compositional ratios of Sb and Te.

A comparison of the ratio ( $\gamma/\delta$ ) of the compositional ratio  $\gamma$  of Sb to the compositional ratio  $\delta$  of Te between the claimed invention of the present application and Kinoshita.

The claimed invention provides for a ratio  $\gamma/\delta$  in the range of 2.16 to 5.00. The composition of the recording layer as described in claim 1 enables direct overwriting at 4.8 m/s to 12.0 m/s.

Attached as Exhibit A hereto is a diagram illustrating a relationship between the ratio  $\gamma/\delta$  and the maximum recording linear velocity at which direct overwriting is possible. The diagram shows that in order to be able to record at a recording linear velocity of 4.8 m/s to 12.0 m/s as described at in the application, it is necessary to use an alloy composition as described in the pending claims.

Kinoshita discloses AgInSbTe recording layers containing 45 to 55% Sb and 30% Te. The AgInSbTe recording layers of Kinoshita have a ratio  $\gamma/\delta$  in a range of 1.50 to 1.83.

The recording layers of Kinoshita simply do not allow for direct overwriting at a recording linear velocity of 4.8 m/s or more, so that recording at 4.8 m/s or more cannot be performed.

The Office Action also contends that the specific ratio of atomic percentages of the AgInSbTe layer can be determined and optimized through experimentation. This contention merely embodies an argument that it might have been obvious to try

different percentages, and obvious-to-try also is not the standard for §103 obviousness.

Here, Applicants were confronted with the problem of devising a phase-change type optical information recording medium which can have excellent characteristics over a range of low to high linear velocities.

As mentioned above, Kinoshita purports to disclose an optical recording medium which is highly sensitive at a relatively low recording linear velocity. Kinoshita does not purport to be motivated to provide a phase-change type optical information recording medium which can have excellent characteristics over a range of low to high linear velocities.

Therefore, contrary to the Office Action, one confronted with the problem of devising a phase-change type optical information recording medium which can have excellent characteristics over a range of low to high linear velocities, would not have used the optical recording medium of Kinoshita as a starting point for experimentation.

Since the cited art does not disclose or suggest each and every feature of the claimed invention, the cited art does not render the claimed invention unpatentable.

Accordingly, for at least the above-stated reasons, Applicants respectfully submit that independent claims 1 and 8, and the claims depending therefrom, are patentable over the cited art.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such

a petition. The Office is hereby authorized to charge any fees that may be required in connection with this response and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Allowance of this application is respectfully requested.

Respectfully submitted,

  
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